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Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

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**FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY**

In the Matter of )

Federal-State Joint Board on )  
Universal Service )

CC Docket 96-45

Forward-Looking Mechanism )  
for High Cost Support for )  
Non-Rural LECs. )

CC Docket 97-160

**JOINT COMMENTS OF BELL SOUTH CORPORATION, BELL SOUTH  
TELECOMMUNICATIONS, INC., US WEST, INC., AND SPRINT LOCAL TELEPHONE  
COMPANIES REGARDING THE SEPTEMBER 11, 1997 WORKSHOP**

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**September 24, 1997**

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**I. INTRODUCTION**

The Joint Sponsors (Sprint Local Companies, US WEST and BellSouth) of the Benchmark Cost Proxy Model ("BCPM") would like to take this opportunity to thank Bill Sharkey, Mark Kennet, and Anthony Bush, other members of the FCC Staff, as well as Vaikunth Gupta and members of Panum Telecom, for their valuable input in the development of the proposed outside plant loop design methods presented during the September 11, 1997 workshop. As with the Customer Location presentation, the Joint Sponsors recognize that the proxy models can benefit from improvements and that, as is often the case, the best way to reach the next higher level of accuracy in modeling is to take advantage of a fresh perspective. Again, the Joint Sponsors assert they have done just that in recent improvements in the BCPM. We are encouraged that the FCC Staff has independently developed both a customer location approach and outside plant design similar to that used in the enhanced BCPM.

## **II. COMMENTS**

**Given that one has successfully identified where customers truly reside, the next crucial step in accurately determining the cost of Universal Service and the resulting subsidy, is correct and sound engineering. As the Joint Sponsors stated in their September 17<sup>th</sup>, 1997 *ex-parte* comments on Outside Plant Engineering, the improvements offered by the BCPM's unique grid approach have allowed us to improve upon implementation of a solid and well received engineering approach. The FCC Staff and Dr. Gupta recognize this same fact. Using the very similar grid concept proposed by Dr. Kennet, both the FCC staff and Dr. Gupta have used variable-sized grids to improve the engineering used in the proxy models.**

**In recognition of the noted deficiencies of using the Census Block Group as the modeling unit, the Joint Sponsors and the FCC have proposed a similar modeling unit known as the grid. Using this new geographic unit, the FCC and the Joint Sponsors' have also developed engineering approaches that are strikingly similar. The Joint Sponsors believe that they implemented an approach that replicates the best of the FCC approach.**

**The Joint Sponsors are, however, disturbed that the FCC has recommended a long copper loop approach, similar to the Hatfield approach. This approach is not an economic, forward-looking approach. HDSL and T1 are acceptable technologies when considering extensions of embedded plant. That is, when copper feeder has already been placed, it is less expensive to install these types of technologies to provide acceptable service on long copper loops. However, in new developments or under a scorched node concept, the fiber fed DLC type technology is the industry accepted standard of providing acceptable service on long loops.**

**The following table contains a comparison of the FCC's and the enhanced BCPM's outside plant design and engineering approaches. In addition, a comparison to**

the Hatfield proposal is included. (The assessment of the Hatfield proposal is based on the best information which is publicly available regarding Hatfield's forthcoming model, i.e., verbal comments and notes from customer location and loop design presentations.) This table outlines the numerous issues where the FCC Staff's proposal and BCPM concur. Where the methods are not consistent, the enhanced BCPM's Joint Sponsors submit that they have implemented a more effective and technically sound approach. We have gone beyond conceptualization of this cost-effective approach, placing this approach in production to generate proxy model results.

<b>Customer Location Item</b>	<b>FCC Proposal</b>	<b>BCPM Proposal</b>	<b>Hatfield Proposal</b>
<b>Geographic Entity used in Model</b>	Consistent Grid	Flexible Consistent Grid incorporating engineering criteria that accounts for customer clusters where they actually exist.	Cluster of some sort
<b>Method to assign Households to Geographic Entity</b>	All households in Census Block assigned to Grid containing the CB centroid.	Households are partitioned to Grids based on road network dispersion within Census Block.	Geocoding of Households. Proprietary clustering algorithm. At most, 44% accuracy in rural areas.
<b>Maximum Size of geographic Entity</b>	18,000ft by 18,000ft grid.	12,000 ft by 14,000ft grid (can be adjusted outside of model).	Cluster and Super Clusters. No stated maximum size.
<b>Minimum Size of geographic Entity</b>	Unknown	1,500ft by 1,700ft grid.	Cluster and Super Cluster. No stated minimum size.
<b>Distribution Engineering</b>	Multiple FDI's within a grid if line count limits exceeded. First FDI encountered is the Primary FDI. All	Grid is Carrier Serving Area. Quadrants within the Grid considered possible distribution areas. Existence and	Still under development. Phase 1 will be some sort of Cluster with Road Cables. Phase 2 is unknown.

	other FDI's are fed from primary.	Size of Distribution area based on actual road and household data in quadrant. Number of Feeder Distribution Interfaces is dependent on number of lines.	
<b>Feeder Engineering</b>	Feeders are fit based upon optimal angular feeder routes using locations of primary SAIs. Feeder can split. Uses some type of cost routine to determine need for second feeder.	Up to 4 feeders. Main feeders go straight for 10,000ft. They then may split depending upon population dispersion. Feeders will be pointed to population areas.	4 Feeders. Follow straight East, North, West, and South routes.
<b>Feeder Sharing/Tapering</b>	Yes	Yes	Yes
<b>Sub-feeder Engineering</b>	Sharing by grid.	Sub-feeder will emanate from Main feeder. Will be shared along common routes to geographic entity.	Sub-feeder to each Geographic Entity. No sharing.
<b>Sub-Feeder Tapering/Sharing</b>	Yes	Yes	Unknown
<b>DLC Placement</b>	One or more within grid. Located at Cluster in grid.	Road Centroid of Grid.	Population Cluster Center.
<b>Engineering of Copper loops over 18000ft</b>	DS1/T1-HDSL running off of Fiber fed DLC site. DS1/T1 may have a midspan repeater. DS1/T1 is terminated on Copper RT.	Not recommended or modeled. Instead, Fiber fed DLC sites are used as forward looking technology.	T1 fed off of Fiber fed DLC site. T1 has repeaters every 6,000ft. T1 is terminated on Copper RT.
<b>FDI Placement</b>	Multiple in Grid. Maximum of 4.	Multiple in Grid. Maximum of 4.	Unknown
<b>Lot Size</b>	Area/(Residence +Business).	Area/(Residence + Business).	Dependent on Density. In rural areas, Town

			customers are on 3 acre lots.
<b>Drop</b>	To Center of Lot.	To Center of Lot. Max of 500 feet.	Independent of Lot. 50 feet in Urban area. Max of 150 feet in rural area.
<b>Geographic Entity creation Process Tested in conjunction with new Loop Engineering and put into production model</b>	Still under development.	Yes, state runs have been made.	Still under development.

### III. CONCLUSION

The FCC staff members, Dr. Gupta and the Joint Sponsors of the enhanced BCPM independently concur in some fundamental tenets regarding outside plant design. The only basic area of major disagreement pertains to the engineering of long copper loops. While the BCPM sponsors contend that the fiber fed DLC approach is the proven and accepted approach, the FCC and Dr. Gupta are proposing a technology that is only economical given the assumption that copper plant already exists since these systems eliminate the need to install fiber. However, this fundamental assumption is inconsistent with a scorched node approach.

Beyond this issue, the Joint Sponsors believe they have built upon the FCC's direction and generated a model that can be executed in a time frame consistent with the Commission's objectives for Universal Service implementation. For the reasons

elaborated upon above, the Joint Sponsors recommend that the customer location and network design algorithms they propose be adopted by the Commission.

Respectfully submitted,

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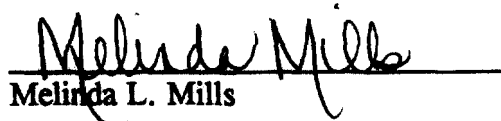
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September 24, 1997

## CERTIFICATE OF SERVICE

I, Melinda L. Mills, hereby certify that I have on this 24<sup>th</sup> day of September, 1997, served via U.S. First Class Mail, postage prepaid, or Hand Delivery, a copy of the foregoing "Joint Comments of BellSouth Corporation, BellSouth Telecommunications, Inc., US West, Inc., and Sprint Local Telephone Companies to Regarding the September 11, 1997 Workshop" in the Matter of Federal-State Joint Board on Universal Service, CC Docket No. 96-45, and Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, CC Docket No. 97-160, filed this date with the Acting Secretary, Federal Communications Commission, to the persons on the attached service list.

  
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